Ministry of higher education
Higher Institute of Engineering
at Oct 6 City

Subject: Operating Systems
Year: Second
Final -Term Exam May 2014

Question 1: Write (x) or (√) for the following statements (10 marks)

1 Registers are memory locations inside CPU. ( )

2 Compaction is the solution for internal fragmentation. ( )

3 Paging technique divides memory into frames. ( )

4 Process is a program in execution.. ( )

5 Virtual memory is used to increase the performance of the system. ( )

6 Unix OS supports many threads per process. ( )

7 Dynamic partitioning limits number of active processes. ( )

8 In Starvation, the same process is selected as victim process many times. ( )

9 In buffering technique, local copies retained as long as there is local memory available to hold it. ( )

10 DMA device controller transfers blocks of data from buffer storage to the CPU directly. ( )

Question 2: Answer 3 questions only (15 marks)

a) Draw only the five-state process model

b) Explain briefly the interrupt cycle.

c) Draw only the relationship between the cache memory and the processor (how cache memory works).

d) Explain briefly Asymmetric multiprocessing computer system.

Question 3: (15 marks)

1) Define deadlock and its conditions?

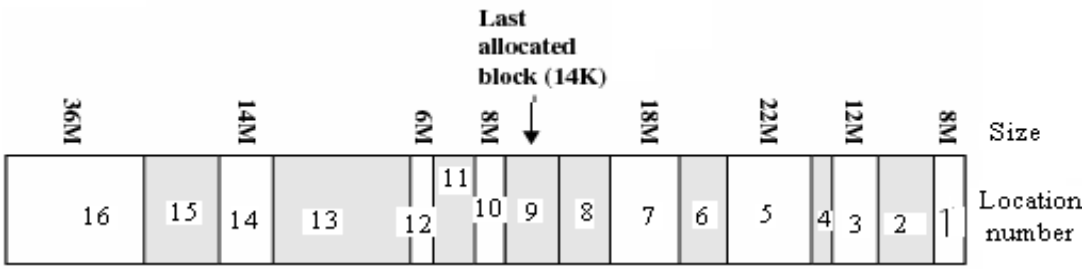
2) Explain briefly the preemptive threading model.

3) Using Preemptive SJF technique, draw the Gantt chart, calculate the average waiting time and the turnaround time for these processes.

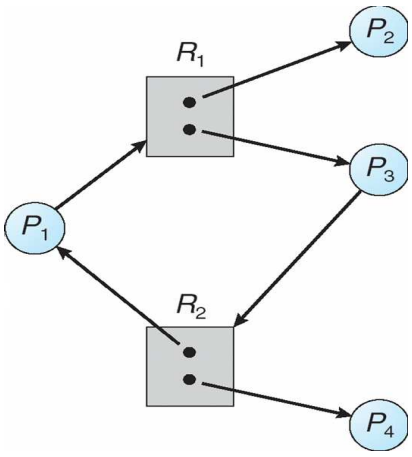
Process	Arrival time	Burst Time
P_1	0.0	8
P_2	3.0	5
P_3	5.0	2
P_4	6.0	5

Question 3: (20 marks)

1. What are the components of operating system?
2. If a program of size 15 MB will be allocated in the memory**, in what location number** will be allocated according to the best fit, first fit and next fit allocation technique, if the memory configurations as shown in the following figure?



3. Is the resource allocation graph represents a deadlock case? Why?



4. Apply the Banker's algorithm to determine the sequence of processes termination and whether the system is in a safe or unsafe state.

Available Matrix

R1	R2	R3
3	3	2

Claim Matrix

	R1	R2	R3
P0	7	5	3
P1	3	2	2
P2	9	0	2
P3	2	2	2
P4	4	3	3

Allocation Matrix

	R1	R2	R3
P0	0	1	0
P1	2	0	0
P2	3	0	2
P3	2	1	1
P4	0	0	2

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